



1631

PATENT

Attorney Docket No.: A-69566-1/RFT/RMS/RMK
DW File No. 463077-105

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

CHIRINO, et al.

Serial No. 09/903,378

Filed: July 10, 2001

For: *Protein Design Automation for
Designing Protein Libraries with
Altered Immunogenicity*

Examiner: BORIN, Michael L.

Group Art Unit: 1631

CERTIFICATE OF MAILING

I hereby certify that this correspondence, including listed enclosures, is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231:

Dated: March 10, 2003

Signed: Marjorie Jost
Marjorie Jost

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

In satisfaction of the duty of disclosure under 37 C.F.R. § 1.56, and in accordance with the provisions of 37 C.F.R. §§ 1.97 and 1.98, Applicants wish to draw the attention of the U.S. Patent and Trademark Office to the references cited on the accompanying substitute for form PTO-1449. Copies of the references are enclosed.

None of the foregoing references are believed to disclose the invention as claimed.

Nothing herein shall constitute an admission concerning the contents of any of the cited references, nor shall the inclusion of a reference herein be considered an admission that the reference constitutes prior art against the invention claimed in the above-identified application.

Submission of the present document shall not be construed as an admission that a search has been made or that better art does not exist.

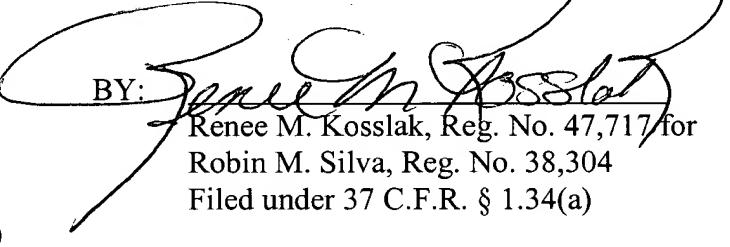
As far as is known to the undersigned, this Information Disclosure Statement is being filed before the mailing date of a first Office Action on the merits as set forth in 37 C.F.R. § 1.97(b), and therefore no fee is required. Although no fee is believed to be due, the Commissioner is authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-2319 (Our Order No. 463077-105 (A-69566-1/RFT/RMS/RMK)).

Respectfully submitted,

DOSEY & WHITNEY LLP

Dated: 3/10/03
Customer Number: 32940
Dorsey & Whitney LLP
Intellectual Property Department
Four Embarcadero Center, Suite 3400
San Francisco, CA 94111-4187
Telephone: (415) 781-1989
Facsimile: (415) 398-3249

BY:


Renee M. Kossak, Reg. No. 47,717 for
Robin M. Silva, Reg. No. 38,304
Filed under 37 C.F.R. § 1.34(a)

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute¹ for form 1449A/PTO
(Modified)INFORMATION DISCLOSURE
STATEMENT BY APPLICANT

(use as many sheets as necessary)

MAR 18 2003

U.S. PATENT & TRADEMARK OFFICE
INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Sheet

1

of

4

Complete if Known

Application Number	09/903,378
Filing Date	July 10, 2001
First Named Inventor	CHIRINO, Arthur J.
Group Art Unit	1631
Examiner Name	BORIN, Michael
Attorney Docket Number	A-69566-1/RFT/RMS/RMK (463077-105)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	U.S. Patent Document Number-Kind Code ² (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
A1	4,939,666		07/1990	Hardman	
A2	5,241,470		08/1993	Lee et al.	
A3	5,527,681		06/1996	Holmes	
A4	6,037,135		03/2000	Kubo et al.	
A5	6,188,965 B1		02/2001	Mayo et al.	
A6	6,403,312 B1		06/2002	Dahiyat et al.	
A7	2001-0032052 A1		11/2001	Mayo et al.	
A8	2001-0039480 A1		11/2001	Mayo et al.	
A9	2002-0004706 A1		01/2002	Mayo et al.	
A10	2002-0048772 A1		04/2002	Dahiyat, et al.	
A11	2002-0090648 A1		07/2002	Dahiyat et al.	
A12	2002-0106694 A1		08/2002	Mayo et al.	

RECEIVED
U.S. PATENT & TRADEMARK OFFICE
MAR 20 2003
MAIL CENTER 1600/2900

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.	Foreign Patent Document Country Code ² Number ⁴ Kind Code ⁵ (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
B1	WO 95/05849 A1		03/1995	Mouritsen, S., and H. Elsner		
B2	WO 95/22625 A1		08/1995	AFFYMAX TECH NV		
B3	WO 98/32845 A1		07/1998	BIIOINVENT INT AB		
B4	WO 99/49893 A1		10/1999	Delisi, C., et al.		
B5	WO 00/23564 A2		04/2000	XENCOR		
B6	WO 00/68396 A3		11/2000	XENCOR		
B7	WO 01/59066 A3		08/2001	XENCOR		
B8	EP 0 279 994 A2		12/1987	Berzofsky, J.A., et al.		

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ⁶
C1	Borman, S., "Proteins to Order," Chemical and Engineering Newsletter (C&EN) Oct. 6, 1997, 9-10 (1997).		
C2	Bowie, J.U., et al., "Deciphering the Message in Protein Sequences: Tolerance to Amino Acid Substitutions", Science vol.247:1306-1310 (Mar. 1990).		
C3	Brenner, S.E., and A. Berry, "A quantitative methodology for the de novo design of proteins", Protein Sci. 3:1871-1882 (Oct. 1994).		

Examiner Signature	Date Considered
--------------------	-----------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible.⁶ Applicant is to place a check mark here if English Language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231. 1105756_1.DOC

O I P E
MAR 18 2003
SC100
PAP

Substitute PTO/SB/8A (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO
(Amended)
**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **2** of **4** Attorney Docket Number **A-69566-1/RFT/RMS/RMK (46107-105)**

Complete if Known

Application Number **09/903,378**
Filing Date **July 10, 2001**
First Named Inventor **CHIRINO, Arthur J.**
Group Art Unit **1631**
Examiner Name **BORIN, Michael**

MAR 20 2003
TECH CENTER 1600
RECEIVED

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ⁶
C4	Brooks, B.R., et al., "CHARMM: A Program for Macromolecular Energy, Minimization, and Dynamics Calculations," J. of Computational Chemistry, 4(2):187-217 (1983).		
C5	Connolly, M.L., "Solvent-Accessible Surfaces of Proteins and Nucleic Acids", Science vol.221(4612):709-713 (Aug. 1983).		
C6	Cornell, W.D., et al., "A Second Generation Force Field for the Simulation of Proteins, Nucleic Acids, and Organic Molecules," J. Am. Chem. Soc., 117:5179-5197 (1995).		
C7	Dahiyat, B.I., et al., "Protein design automation," Caltech Biology Annual Report, 172 (1995).		
C8	Dahiyat, B.I., et al., "Protein Design Automation," Meeting Abstract; Protein Science vol. 4, Suppl. 2, 83 (1995).		
C9	Dahiyat, B.I., et al., "Protein design Automation," Poster Sessions, Protein Science vol.5, Suppl. 1, 22-23 (1996).		
C10	Dahiyat, B.I., and S.L. Mayo, "Protein design automation," Protein Sci. 1996 May;5(5):895-903		
C11	Dahiyat, B.I., et al., "Probing the Role of Specificity in Protein Design," Caltech Biology Annual Report, 160-161 (1996).		
C12	Dahiyat, B.I., et al., "Automated design of the surface positions of protein helices", Protein Science 6:1333-1337 (Jun. 1997).		
C13	Dahiyat, B.I., et al., "First fully automatic design of a protein achieved by Caltech scientists", new press release (Oct. 1997).		
C14	Dalal, S., et al., "Protein alchemy: Changing β -sheet into α -helix", Nature Struc. Biol. vol.4(7):548-552 (Jul. 1997).		
C15	DeGrado, W., "Proteins from Scratch," Science, 278:80-81 (1997).		
C16	Desjarlais, J.R., and T.M. Handel, "New strategies in protein design," Current Opinion in Biotechnology :460-466 (1995).		
C17	Desmet, J., et al., "The dead-end elimination theorem and its use in protein side-chain positioning", Nature vol.356:539-542 (Apr. 1992).		
C18	DESMET, J., et al., "The 'Dead End Elimination' Theorem: A New Approach to the Side Chain Packing Protein", from "The Protein Folding Problem and Tertiary Structure Prediction" Merz and Le Grand, eds. Birkhauser, Boston, Ch.10, pp. 307-337 (1994)		
C19	Desmet, J., et al., "Theoretical and Algorithmical Optimization of the Dead-End Elimination Theorem," Proceedings of the Pacific Symposium on Biocomputing '97, 122-133 (1997).		
C20	Dunbrack Jr., R.L., and M. Karplus, "Conformational analysis of the backbone-dependent rotamer preferences of protein sidechains", Struc. Biol. vol.1(5):334-340 (May 1994).		
C21	Eisenberg, D., and A. McLachlan, "Solvation energy in protein folding and binding", Nature vol.319:199-203 (Jan. 1986).		
C22	Gallop, M.A., et al., "Applications of Combinatorial Technologies to Drug Discovery. 1. Background and Peptide Combinatorial Libraries," Journal of Medicinal Chemistry Vol. 37, No. 9 (April 29, 1994), 1233-1251.		
C23	Goldstein, R.F., "Efficient Rotamer Elimination Applied to Protein Side-Chains and Related Spin Glasses", Biophys. Jour. vol.66:1335-1340 (May 1994).		
C24	Gordon, D.B., et al. "Energy functions for protein design," Curr. Opinion in Struct. Biol., 9:509-513 (1999).		

Examiner Signature	Date Considered
--------------------	-----------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible.

⁶ Applicant is to place a check mark here if English Language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231. 1105756_1.DOC

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO
(Modified)

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet

3

of

4

Complete if Known

Application Number	09/903,378
Filing Date	July 10, 2001
First Named Inventor	CHIRINO, Arthur J.
Group Art Unit	1631
Examiner Name	BORIN, Michael

Attorney Docket Number

A-69566-1/RFT/RMS/RMK (463074-35)

RECEIVED
MARCH 20 2003
TECH CENTER 1600
USPTO**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ⁶
	C25	Harbury, P.B., et al., "High-Resolution Protein Design with Backbone Freedom," <i>Science</i> , 282:1462-1467 (1998).	
	C26	Hellinga, H.W., and F.M. Richards, "Optimal sequence selection in proteins of known structure by simulated evolution," <i>Proc Natl Acad Sci U S A</i> . 1994 Jun 21;91(13):5803-7.	
	C27	Hellinga, H.W., "Rational protein design: Combining theory and experiment", <i>Proc. Natl. Acad. Sci. USA</i> vol.94:10015-10017 (Sep. 1997).	
	C28	Hemmer, B., et al., "Contribution of individual amino acids within MHC molecule or antigenic peptide to TCR ligand potency," <i>J Immunol.</i> 2000 Jan 15;164(2):861-71.	
	C29	Holmes, B., "First-ever designer protein fits like a glove," <i>New Scientist</i> , IPC Magazines Limited, 8 Oct. 11 (1997).	
	C30	Hurley, J., et al., "Design and Structural Analysis of Alternative Hydrophobic Core Packing Arrangements in Bacteriophage T4 Lysozyme," <i>J. Mol. Biol.</i> , 224:1143-1159(1992).	
	C31	Koehl, P., and M. Levitt, "De Novo Protein Design. I. In Search of Stability and Specificity," <i>J. Mol. Biol.</i> , 293:1161-1181 (1999).	
	C32	Kortemme, T., et al., "Design of a 20-Amino Acid, Three-Stranded β -Sheet Protein," <i>Science</i> , 281:253-256 (1988).	
	C33	Lam, K.S., "Application of Combinatorial Library Methods in Cancer Research and Drug Discovery," <i>Anti-Cancer Drug Design</i> (1997), 12, 145-167.	
	C34	Lasters, I., et al., "Enhanced dead-end elimination in the search for the global minimum energy conformation of a collection of protein side chains," 1995, <i>Protein Engineering</i> , vol. 8, No. 8, pp. 815-822.	
	C35	Lasters, I., et al., "Dead-End Based Modeling Tools to Explore the Sequence Space That is Compatible with a Given Scaffold", <i>Jour. of Protein Chem.</i> vol.16(5):449-452 (Jul. 1997).	
	C36	Lazar, G., et al., "De novo design of the hydrophobic core of ubiquitin," <i>Protein Science</i> 6:1167-1178 (1997).	
	C37	Lee, C. and M. Levitt, "Accurate prediction of the stability and activity effects of site-directed mutagenesis on a protein core," <i>Nature</i> , 352:448-451 (1991).	
	C38	Lim, W.A., et al., "The crystal structure of a mutant protein with altered but improved hydrophobic core packing," <i>Proc Natl Acad Sci U S A</i> . 1994 Jan 4;91(1):423-7	
	C39	Mayo, S., et al., "DREIDING: A Generic Force Field for Molecular Simulations," <i>J. Phys. Chem.</i> , 94:8897-8909 (1990).	
	C40	Minor Jr., D.L., and P. Kim, "Measurement of the β -sheet-forming propensities of amino acids", <i>Nature</i> vol.367:660-663 (Feb. 1994).	
	C41	Munoz, V., and L. Serrano, "Intrinsic Secondary Structure Propensities of the Amino Acids, Using Statistical phi-psi Matrices: Comparison with Experimental Scales", <i>Proteins</i> 20:301-311 (1994).	
	C42	Munoz, V., and L. Serrano, "Helix design, prediction and stability", <i>Curr. Opin. in Biotech.</i> 6:382-386 (Aug. 1995).	
	C43	Munoz, V., et al., "Analysis of the effect of local interactions on protein stability", <i>Folding & Design</i> 1(3):167-178 (Apr. 1996).	
	C44	Novak, E.J., et al., "Tetramer-guided epitope mapping: rapid identification and characterization of immunodominant CD4+ T cell epitopes from complex antigens," <i>J Immunol.</i> 2001 Jun 1;166(11):6665-70.	
	C45	Pabo, C., "Designing proteins and peptides", <i>Nature</i> vol.301:200 (Jan. 1983).	

Examiner Signature	Date Considered
--------------------	-----------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible.

⁶ Applicant is to place a check mark here if English Language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231. 1105756_1.DOC

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<p>Substitute for form 1449A/PTO (Modified)</p> <p>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p> <p>(use as many sheets as necessary)</p>		<p>Complete if Known</p> <p>Application Number 09/903,378</p> <p>Filing Date July 10, 2001</p> <p>First Named Inventor CHIRINO, Arthur J.</p> <p>Group Art Unit 1631</p> <p>Examiner Name BORIN, Michael</p>	
Sheet	4	of	4
		Attorney Docket Number A-69566-1/RFT/RMS/RMK (46307-205)	

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ⁶
P E	C46	Padmanabhan, S., et al., "Relative helix-forming tendencies of nonpolar amino acids", Nature vol.344:268-270 (Mar. 1990).	
8 2003	C47	Parker, K.C., et al., "Scheme for ranking potential HLA-A2 binding peptides based on independent binding of individual peptide side-chains," J Immunol. 1994 Jan 1;152(1):163-75.	
	C48	Pierce, NA et al., "Conformational Splitting: A More Powerful Criterion for Dead-End Elimination," J Comput Chem 21(11):999-1009 (2000)	
ELIAFNC	C49	Ponder, J.W., et al., "Use of Packing Criteria in the Enumeration of Allowed Sequences for Different Structural Classes", release by Acad. Press Inc. (London) Ltd. pp.775-791(1987).	
	C50	Raddrizzani, L., and J. Hammer, "Epitope scanning using virtual matrix-based algorithms," Brief Bioinform. 2000 May;1(2):179-89.	
	C51	Rappe, A.K., and W.A. Goddard III, "Charge Equilibration for Molecular Dynamics Simulations," J. Phys. Chem., 95:3358-3363 (1991).	
	C52	Regan, L., "Helix is a helix is a helix?" Proc. Natl. Acad. Sci. USA vol:94:2796-2797 (Apr. 1997).	
	C53	Smith, C.K., and L. Regan, "Guidelines for Protein Design: The Energetics of β -Sheet Side Chain Interactions", Science vol.270:980-982 (Nov. 1995).	
	C54	Stickle, D.F., et al., "Hydrogen Bonding in Globular Proteins," (1992) Journal of Molecular Biology, vol.226, pp. 1143-1159.	
	C55	Sun, S., et al., "Designing amino acid sequences to fold with good hydrophobic cores", Protein Eng. vol.8(12):1205-1213 (1995).	
	C56	Tuffery, P., et al., "A New Approach to the Rapid Determination of Protein Side Chain Conformations," J. of Biomolecular Struct. & Dynamics, 8(6):1267-1289 (1991).	
	C57	van Gunsteren, W.F., and A. Mark, "Prediction of the Activity and Stability Effects of Site-directed Mutagenesis on a Protein Core," J. Mol. Biol., 227:389-395 (1992).	
	C58	Villegas, V., et al., "Stabilization of proteins by rational design of α -helix stability using helix/coil transition theory," Folding & Design, 1(1):29-34 (1995).	
	C59	Wesson, L., and D. Eisenberg, "Atomic solvation parameters applied to molecular dynamics of proteins in solution," Protein Science, 1:227-235 (1992).	
	C60	Wilson, C., et al. "Computational Method for the Design of Enzymes with Altered Substrate Specificity," J. Mol. Biol. (1991) 220,495-506.	
	C61	Wodak, S.J., and J. Janin, "Analytical approximation to the accessible surface area of proteins", Proc. Natl. Acad. Sci. USA vol.77(4):1736-1740 (Apr. 1980).	
	C62		
	C63		
	C64		

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible.

⁶ Applicant is to place a check mark here if English Language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231. 1105756_1.DOC